

Self-Esteem, Narcissism, and Stressful Life Events:

Testing for Selection and Socialization

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### Abstract

We examined whether self-esteem and narcissism predict the occurrence of stressful life events (i.e., selection) and whether stressful life events predict change in self-esteem and narcissism (i.e., socialization). The analyses were based on longitudinal data from two studies, including samples of 328 young adults (Study 1) and 371 adults (Study 2). The effects of self-esteem and narcissism were mutually controlled for each other and, moreover, controlled for effects of depression. After conducting the study-level analyses, we meta-analytically aggregated the findings. Self-esteem had a selection effect, suggesting that low self-esteem led to the occurrence of stressful life events; however, this effect became nonsignificant when depression was controlled for. Regardless of whether depression was controlled for or not, narcissism had a selection effect, suggesting that high narcissism led to the occurrence of stressful life events. Moreover, stressful life events had a socialization effect on self-esteem, but not on narcissism, suggesting that the occurrence of stressful life events decreased self-esteem. Analyses of trait-state models indicated that narcissism consisted almost exclusively of perfectly stable trait variance, providing a possible explanation for the absence of socialization effects on narcissism. The findings have significant implications because they suggest that a person's level of narcissism influences whether stressful life events occur, and that self-esteem is shaped by the occurrence of stressful life events. Moreover, we discuss the possibility that depression mediates the selection effect of low self-esteem on stressful life events.

*Keywords:* self-esteem, narcissism, stressful life events, longitudinal

### Self-Esteem, Narcissism, and Stressful Life Events:

#### Testing for Selection and Socialization

Many people, psychologists and laypeople alike, assume that a person's self-esteem is shaped by the myriad events that occur in a person's life and that, in particular, stressful life events can be turning points that permanently alter a person's self-esteem. For example, getting divorced, losing one's job, contracting a chronic disease, or suffering a criminal victimization might lead to an enduring loss in self-esteem. Surprisingly, however, research is only beginning to examine whether stressful life events influence self-esteem and, more generally speaking, psychologists still need a better understanding of those factors that shape self-esteem development (Orth & Robins, 2014). Therefore, one goal of the present research was to systematically test for the relations between stressful life events and self-esteem. Given that it is not only possible that stressful life events influence self-esteem (a process called socialization) but also that self-esteem influences whether stressful life events occur (a process called selection), we tested for effects in both directions.

A complicating issue in research on self-esteem is that the construct of self-esteem partially overlaps with narcissism because both constructs involve positive self-evaluations. Although self-esteem and narcissism can be conceptually and empirically distinguished (as we explain in more detail below), measures of the two constructs typically show a positive correlation of about medium to large size (Ackerman et al., 2011; Brown & Zeigler-Hill, 2004; Paulhus, Robins, Trzesniewski, & Tracy, 2004). Therefore, it is possible that research examining only one of the constructs shows effects that are attributed to the construct studied (e.g., self-esteem), but that the observed effects are confounded by the construct ignored in the research

(e.g., narcissism). In the present research, we therefore included a measure of narcissism and examined selection and socialization effects for both self-esteem and narcissism.

### **Self-Esteem and Stressful Life Events**

In recent years, a growing number of studies have provided important insights into the general pattern of self-esteem development (for reviews, see Orth & Robins, 2014; Trzesniewski, Donnellan, & Robins, 2013). Longitudinal studies suggest that self-esteem typically increases from adolescence to middle adulthood, peaks at about age 50 to 60 years, and then decreases into old age (Orth, Maes, & Schmitt, 2015; Orth, Trzesniewski, & Robins, 2010). Although stressful life events might play a role in the individual self-esteem trajectory, research has largely neglected the relation between self-esteem and stressful life events. In the following sections, we review the available evidence and theoretical perspectives on selection and socialization effects between self-esteem and stressful life events.

#### **Selection effects**

With regard to selection effects (i.e., whether self-esteem influences the occurrence of events), there is an almost complete lack of evidence. Two studies provide relevant information. First, in a study with a sample of adults aged 55 years and older, self-esteem did not prospectively predict the occurrence of illness and bereavement events (Murrell, Meeks, & Walker, 1991). Second, indirect evidence is provided by a study conducted in the work domain (Kuster, Orth, & Meier, 2013). In that study, self-esteem had a small but significant effect on the participants' employment status, which implies that low self-esteem might increase the chances of becoming unemployed.

Despite the dearth of empirical evidence, there is reason to believe that a person's self-esteem can influence whether stressful life events occur. First, other personality characteristics

such as the Big Five personality traits (Headey & Wearing, 1989; Kandler, Bleidorn, Riemann, Angleitner, & Spinath, 2012; Lüdtke, Roberts, Trautwein, & Nagy, 2011; Magnus, Diener, Fujita, & Pavot, 1993) and affective traits (Vaidya, Gray, Haig, & Watson, 2002) have selection effects on the occurrence of negative life events. Given that the trait character of self-esteem is comparable to other central personality constructs (as indicated by findings on rank-order stability; e.g., Kuster & Orth, 2013; Roberts & DelVecchio, 2000; Trzesniewski, Donnellan, & Robins, 2003), self-esteem might have selection effects similar to the Big Five and affective traits. Second, a growing body of research suggests that self-esteem is consequential for a person's success versus failure in important life domains (Kuster et al., 2013; Orth, Robins, & Widaman, 2012; Trzesniewski et al., 2006). Thus, if self-esteem predicts success versus failure, then self-esteem might also predict the occurrence of stressful events which are often linked to failure in the corresponding life domain.

There are at least two mechanisms by which a person's self-esteem may select for the occurrence of stressful life events, corresponding to theory on person-environment transactions (cf. Caspi, Roberts, & Shiner, 2005; Roberts, Wood, & Caspi, 2008). First, individuals may actively produce specific life events (i.e., a process called self-selection). For example, individuals with low self-esteem might have a greater probability of experiencing relationship break-up and divorce, because they tend to negatively interpret ambiguous behavior of their partners and distance themselves from their partners when difficulties arise (Murray, Holmes, & Griffin, 2000; Murray, Rose, Bellavia, Holmes, & Kusche, 2002). Also, individuals with low self-esteem might experience more rejection by relationship partners because they show undesirable behaviors such as excessive reassurance seeking due to greater attachment-related anxiety (Erol & Orth, 2013). In contrast, individuals with high self-esteem show more positive

illusions about the relationship, which strengthens their relationship satisfaction and lowers the likelihood of relationship conflicts and break-up (Murray, Holmes, & Griffin, 1996a, 1996b). A second possible mechanism is that stressful life events may be caused by others who select individuals with characteristics that predispose them to a specific life experience (a process called selection by others). For example, individuals with low self-esteem might have a greater probability of being selected for roles in which they are treated badly (e.g., being bullied at work, getting involved in an abusive relationship; Egan & Perry, 1998; Kuster et al., 2013).

### **Socialization effects**

With regard to socialization effects (i.e., whether the occurrence of stressful life events influences a person's self-esteem), some evidence is available. Three studies examined whether aggregated stressful life events predicted change in self-esteem. Whereas two of the studies found supporting evidence (Joiner, Katz, & Lew, 1999; Pettit & Joiner, 2001), another study using data from three samples found inconsistent evidence: although in each sample the socialization effect was in the expected direction (i.e., stressful events had a small negative effect on self-esteem), the effect was significant in only one of the samples (Orth, Robins, & Meier, 2009). In addition, two studies tested for effects of specific events: In a study by Neyer and Asendorpf (2001), relationship break-up did not influence self-esteem, and Murrell et al. (1991) found that illness and bereavement events did not predict change in self-esteem. Thus, previous research has yielded inconsistent findings with regard to socialization effects.

There are theoretical reasons to believe that stressful life events shape an individual's self-esteem. First, research on personality development supports the plasticity principle, which states that personality characteristics (such as self-esteem) can be influenced by environmental factors, including life events, at any age (Roberts et al., 2008). In fact, empirical studies suggest

that life events influence the Big Five personality factors (Lüdtke et al., 2011; Specht, Egloff, & Schmukle, 2011) and well-being (Headey & Wearing, 1989; Lucas, 2007; Luhmann, Hofmann, Eid, & Lucas, 2012). Second, research on the patterns of self-esteem development shows that individuals differ substantially in the particular trajectory they follow (Chung et al., 2014; Erol & Orth, 2011; Orth et al., 2010; Wagner, Lüdtke, Jonkmann, & Trautwein, 2013). Stressful life events have the potential to cause interindividual variability in self-esteem development because they occur in the lives of some, but not all, individuals and, moreover, at different times for different individuals.

### **The Overlap Between Self-Esteem and Narcissism**

As mentioned at the beginning of this article, the construct of self-esteem partially overlaps with narcissism and, consequently, effects of self-esteem might be confounded if narcissism is not controlled for. In the present research, we therefore examine selection and socialization effects for both self-esteem and narcissism.

How are self-esteem and narcissism defined? Self-esteem refers to an “individual’s subjective evaluation of his or her worth as a person” (Donnellan, Trzesniewski, & Robins, 2011, p. 718; see also Leary & Baumeister, 2000). Importantly, self-esteem does not necessarily reflect the person’s objective talents, competencies, or social status. Moreover, self-esteem has been described by the feelings of self-acceptance, self-respect, and the “feeling that one is ‘good enough,’” but high self-esteem does not necessarily imply that the individual believes he or she is superior to others (Rosenberg, 1965, p. 31). The construct of narcissism is rooted in mythology and psychoanalytic theory, and is defined by characteristics such as a grandiose self-concept, feelings of superiority, self-centeredness, and sense of entitlement (Ackerman et al., 2011; Bosson et al., 2008; Morf & Rhodewalt, 2001). Although narcissism is related to the categorical

concept of narcissistic personality disorder, narcissism is typically conceived of as a continuous construct, capturing individual differences in narcissism (Foster & Campbell, 2007).

As illustrated by their definitions, the constructs of both self-esteem and narcissism involve positive self-evaluations and therefore overlap conceptually. In fact, empirical research shows that measures of self-esteem and narcissism have shared variance, correlating at about medium to large effect sizes. For example, the correlation between self-esteem and narcissism was .26 in a study by Brown and Zeigler-Hill (2004), .27 in Ackerman et al. (2011), and ranged from .32 to .50 in three samples examined by Paulhus et al. (2004). At the same time, it is important to note that these correlations are not as strong as would be expected if self-esteem and narcissism were actually the same construct. Also, despite some overlap, the constructs of self-esteem and narcissism can be conceptually distinguished, because the definition of self-esteem does not include a sense of superiority and entitlement. Thus, whereas narcissism implies a certain view of other people (i.e., the individual generally feels superior to others and entitled to exploit others), high self-esteem does not necessarily imply a negative view of others (but is compatible with a positive, prosocial attitude towards others; Paulhus et al., 2004).

The difference between self-esteem and narcissism is further supported by research showing that the two constructs have divergent relations with some outcomes. For example, whereas self-esteem is related to low levels of antisocial behavior, aggression, and hostility, narcissism predicts higher levels in these outcomes (Donnellan, Trzesniewski, Robins, Moffitt, & Caspi, 2005; Paulhus et al., 2004; Tracy, Cheng, Robins, & Trzesniewski, 2009). Moreover, whereas self-esteem shows a medium-sized to strong correlation with authenticity, the correlation for narcissism is small (Tracy et al., 2009). Importantly, the divergent effects of self-esteem and narcissism become even clearer when the two constructs are mutually controlled for



each other. For example, when self-esteem was not controlled for narcissism in the study by Paulhus et al. (2004), the self-esteem effect on antisocial behavior was  $\beta = -.04$  (all coefficients reported are averaged across the three samples examined by Paulhus et al., 2004); however, when narcissism was controlled for, the self-esteem effect became  $\beta = -.23$ . For narcissism, when studied alone, the effect was  $\beta = .33$ ; however, when self-esteem was controlled for, the effect became  $\beta = .42$ . Although in many research situations regression coefficients are attenuated when correlated predictors are added to the model, in the study by Paulhus et al. (2004) the coefficients of self-esteem and narcissism became larger (in absolute size) when the complementary measure was included (for similar patterns of findings, see Donnellan et al., 2005; Tracy et al., 2009). Thus, by simultaneously examining self-esteem and narcissism, the present research will provide more valid information on the unique effects of the constructs.

Interestingly, prior research has neglected selection and socialization effects of narcissism in its relation with life events; in fact, we are not aware of any relevant study. However, theory suggests that narcissism may select for stressful life events. For example, narcissistic individuals might more often experience negative events in the relationship domain, such as serious interpersonal conflicts and separation, given their socially toxic attributes such as self-centeredness, willingness to exploit others, aggressiveness, and low level of empathy (Morf & Rhodewalt, 2001; Tracy et al., 2009). Moreover, narcissistic individuals might more often experience accidents and serious illnesses because they show more impulsivity (Vazire & Funder, 2006) and risk-taking behavior (Foster, Shenese, & Goff, 2009), which might compromise their health. With regard to socialization effects of stressful life events on narcissism, theory does not allow for clear-cut hypotheses. However, theoretical perspectives (Morf & Rhodewalt, 2001) and empirical studies (del Rosario & White, 2005; Edelstein,

Newton, & Stewart, 2012; Schütz, Marcus, & Selin, 2004) suggest that narcissism is a very stable personality characteristic; consequently, socialization effects might be small.

### **The Present Research**

The goal of this research was to test whether self-esteem and narcissism predict stressful life events (i.e., to test for selection effects of self-esteem and narcissism) and whether stressful life events influence self-esteem and narcissism (i.e., to test for socialization effects of life events). *Selection effects* have been defined as the prospective effect of a personality construct on the occurrence of life events (Roberts et al., 2008; Specht et al., 2014) and previous research on personality and life events has tested for selection effects consistent with this definition (e.g., Headey & Wearing, 1989; Lüdtke et al., 2011; Magnus et al., 1993; Specht et al., 2011). In the analyses, we operationalized selection effects as the predictive effect of self-esteem and narcissism measured at one of the assessments (e.g., Wave 1) on the occurrence of stressful life events in a subsequent period (e.g., the interval between Wave 1 and Wave 2). *Socialization effects* have been defined as the prospective effect of life events on change in a personality construct (Roberts et al., 2008; Specht et al., 2014), consistent with how socialization effects have been tested in previous research (e.g., Headey & Wearing, 1989; Lüdtke et al., 2011; Magnus et al., 1993; Specht et al., 2011). In the analyses, we operationalized socialization effects as the predictive effect of the occurrence of stressful life events during a time interval (e.g., the period between Wave 1 and Wave 2) on the level of a personality construct at a later point in time (e.g., self-esteem or narcissism at Wave 2) controlling for the previous level of the construct (i.e., the Wave 1 levels of self-esteem and narcissism). Controlling for the previous levels of the constructs allows examination of effects on change in the constructs (Finkel, 1995; Little, Preacher, Selig, & Card, 2007).

We used data from two longitudinal studies to replicate the analyses of selection and socialization effects across samples. The two studies differed with regard to the age range of the sample (18–25 years in Study 1 vs. 18–61 years in Study 2) and the number of waves of measurement (four in Study 1 vs. two in Study 2), but they were similar with regard to measures and additional design characteristics. In the analyses, the effects of self-esteem and narcissism were mutually controlled for each other. After conducting the study-level analyses, we meta-analytically aggregated the findings across studies, thereby increasing the power of the tests, precision of the estimates, and generalizability of the findings.

To increase the validity of the analyses, we examined self-esteem and narcissism as latent variables. The crucial advantage of using latent instead of observed variables is that measurement error, which may significantly bias the results, is controlled for (Cole & Preacher, 2014). Also, in the first step of the analyses, we tested for measurement invariance of the measures of self-esteem and narcissism, because the results of the models testing for selection and socialization are valid only if metric measurement invariance holds (Schmitt & Kuljanin, 2008).

Moreover, we tested whether selection and socialization effects hold when controlling for the effects of an important possible confound, specifically depression. The reason is that a large body of research demonstrates that selection and socialization effects are of particular importance in the relation between stressful life events and depression. Clearly, stressful life events can lead to, and exacerbate, depression (Hammen, 2005; Kessler, 1997). Moreover, research suggests that, in turn, depression may cause future stressful life events, a phenomenon that has been called *stress generation* (Davila, Bradbury, Cohan, & Tochluk, 1997; Hammen, 1991, 2005). In the present research, it is particularly important to control for the effects of

depression, because both self-esteem and narcissism are related to depression. Self-esteem typically shows a strong negative correlation with depression: for example, in a recent meta-analysis the cross-sectional correlation between self-esteem and depression was estimated as  $-.57$  (Sowislo & Orth, 2013). The relation between narcissism and depression is less strong; nevertheless, cross-sectional studies suggest a negative correlation of small to medium size (Aalsma, Lapsley, & Flannery, 2006; Sedikides, Rudich, Gregg, Kumashiro, & Rusbult, 2004; Watson & Biderman, 1993). We therefore tested whether selection and socialization effects of self-esteem and narcissism are unique (i.e., hold when controlling for depression) or whether they are due to overlap with depression. However, even if self-esteem has a selection effect that does not hold when controlling for depression, it is important to note that the effect might nevertheless be relevant. The reason is that a growing body of research suggests that low self-esteem is a prospective risk factor for depression (Orth, Robins, & Roberts, 2008; Orth, Robins, Trzesniewski, Maes, & Schmitt, 2009; Sowislo & Orth, 2013; Steiger, Allemand, Robins, & Fend, 2014; for a review, see Orth & Robins, 2013). Thus, depression might be one of the mediating mechanisms through which low self-esteem contributes to the occurrence of stressful life events.

## **Study 1**

### **Method**

The data used in Study 1 come from the study Your Personality (YP), a German-language longitudinal study with a sample of young adults living in Switzerland (Orth, Robins, Meier, & Conger, in press). The study included four assessments at 6-month intervals. Data were collected using Web-based questionnaires. Participants were recruited by contacting members of a university-based online panel, which includes individuals who are interested in occasionally

participating in Web-based studies. Only panel members who were aged 18 to 25 years were invited for the study. Participants received information on the purpose and procedure of the study and were informed that their data would be treated as strictly confidential. After providing informed consent, participants received individual links to the assessments. After completion of the study, participants were provided with individualized feedback on selected study variables (i.e., how their scale scores compared with population norms) and received 60 Swiss francs in exchange for participation in the study.

**Participants.** The sample included 328 individuals (50% female).<sup>1</sup> At Wave 1, mean age of participants was 21.2 years ( $SD = 1.9$ , range 18 to 25). Twenty percent had completed the obligatory 9 school years or less, 73% had completed secondary education (approximately 12 years), and 7% had a bachelor's degree (including one participant who already had a master's degree). Of the participants, 53% provided data at all four waves, 13% at three waves, 10% at two waves, and 24% at one wave. To investigate the potential impact of attrition, we compared individuals who dropped out of the study with individuals who completed the last wave of data collection, using the study variables at Wave 1. Participants who dropped out did not differ significantly on any of the variables (i.e., age, gender, education, self-esteem, narcissism, and depression). Thus, nonrepresentativeness due to attrition was not a concern in the present study.

### **Measures.**

**Self-esteem.** Self-esteem was assessed with the 10-item Rosenberg Self-Esteem Scale (RSE; Rosenberg, 1965; for the German version, see von Collani & Herzberg, 2003), the most frequently used and well-validated measure of self-esteem (Robins, Hendin, & Trzesniewski, 2001), using a 5-point scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). Coefficient alpha was .91 at Wave 1, .90 at Wave 2, .91 at Wave 3, and .92 at Wave 4.

***Narcissism.*** Narcissism was assessed with the Narcissistic Personality Inventory (NPI; Raskin & Hall, 1979; for the German version, see Schütz et al., 2004), using the 16-item short form suggested by Ames, Rose, and Anderson (2006). The NPI is the most frequently used and well-validated measure of narcissism (Ackerman et al., 2011; Corry, Merritt, Mrug, & Pamp, 2008; Emmons, 1987; Raskin & Terry, 1988). The NPI uses a forced-choice response format; that is, each item consists of two statements (one narcissistic and one nonnarcissistic statement) and participants are asked to choose the one that describes them better. For each item, the narcissistic statement was coded as 1 and the nonnarcissistic statement was coded as 0. In particular, when items are dichotomous, coefficient alpha can underestimate the reliability of a scale (Raykov, Dimitrov, & Asparouhov, 2010). We therefore used coefficient omega (McDonald, 1999), following the recommendation by Widaman, Little, Preacher, and Sawalani (2011). Coefficient omega was .78 at Wave 1, .81 at Wave 2, .80 at Wave 3, and .82 at Wave 4.

***Stressful life events.*** At Waves 2 to 4, stressful life events were measured using a checklist of 16 events (for similar checklists, see Lüdtke et al., 2011; Orth, Robins, & Meier, 2009). Participants were asked which of the events they had experienced during the past six months (corresponding to the period between the waves). Thus, the responses from Waves 2 to 4 covered the period between Waves 1 to 4. The checklist included the following events: rejection by a person you loved; serious problems in marriage/relationship; separation/divorce; serious accident/injury; serious illness; victim of a disaster; victim of violence/crime; serious conflict with family member or friend; serious illness of someone close to you; death of someone close to you; accused/convicted for a crime; serious failure in education/work; dropped out of college/professional training; dismissal or serious trouble at work; unemployment; serious financial problems. We did not compute coefficient alpha or coefficient omega for the checklist,

as these coefficients are not appropriate indicators of reliability because the heterogeneous events do not measure an internally consistent construct (Bollen & Lennox, 1991; Streiner, 2003).

**Depression.** Depression was assessed with the 20-item Center for Epidemiologic Studies Depression Scale (CES-D, Radloff, 1977; for the German version, see Hautzinger & Bailer, 1993). The CES-D is a frequently used self-report measure for the assessment of depressive symptoms in non-clinical, sub-clinical, and clinical populations, and its validity has been repeatedly confirmed (Eaton, Smith, Ybarra, Muntaner, & Tien, 2004). Participants were instructed to assess the frequency of their reactions during the past week, using a 4-point scale (0 = *rarely or none of the time, less than one day*; 1 = *some or a little of the time, one to two days*; 2 = *occasionally or a moderate amount of time, three to four days*; 3 = *most or all of the time, five to seven days*). Coefficient alpha was .91 at Wave 1, .92 at Wave 2, .91 at Wave 3, and .89 at Wave 4.

**Statistical Analyses.** Analyses were conducted using the Mplus 7.2 program (Muthén & Muthén, 2012). To deal with missing values, we employed full information maximum likelihood estimation to fit models directly to the raw data, which produces less biased and more reliable results compared with conventional methods of dealing with missing data, such as listwise or pairwise deletion (Schafer & Graham, 2002; Widaman, 2006). Fit was assessed by the comparative fit index (CFI), the Tucker-Lewis index (TLI), and the root-mean-square error of approximation (RMSEA), based on the recommendations of Hu and Bentler (1999) and MacCallum and Austin (2000). Hu and Bentler (1999) suggest that good fit is indicated by values greater than or equal to .95 for CFI and TLI, and less than or equal to .06 for RMSEA.

## **Results and Discussion**

Table 1 shows means and standard deviations of the measures (for intercorrelations among the measures, see Supplemental Table S1).

**Measurement invariance of self-esteem and narcissism.** In the first step of the analyses, we tested for metric measurement invariance of self-esteem and narcissism (Schmitt & Kuljanin, 2008; Widaman, Ferrer, & Conger, 2010). The results of the structural models examined in this article are valid only if metric measurement invariance holds (Schmitt & Kuljanin, 2008), which can be tested by comparing the fit of a measurement model in which the factor loadings are constrained to be equal across waves with the fit of a measurement model in which the factor loadings are freely estimated. Figure 1 provides an illustration of the measurement model, shown for the example of self-esteem (the measurement model of narcissism was specified accordingly). We used item parcels as indicators of the latent factors because parcels produce more reliable latent variables than individual items (Little, Cunningham, Shahar, & Widaman, 2002). Parcels were created in identical ways across waves, using the balancing technique recommended by Little, Rhemtulla, Gibson, and Schoemann (2013). The error variances of each parcel were allowed to correlate across waves to control for bias due to parcel-specific variance (Cole & Maxwell, 2003). The fit of the measurement models was good (Table 2). For both self-esteem and narcissism, constraining the loadings to be equal across waves did not significantly worsen model fit, as indicated by  $\chi^2$ -difference tests for both self-esteem ( $\Delta\chi^2 = 3.4$ ,  $\Delta df = 6$ , *ns*) and narcissism ( $\Delta\chi^2 = 8.3$ ,  $\Delta df = 6$ , *ns*), suggesting that metric measurement invariance held. Consequently, we used these constraints in the remainder of the analyses.

**Selection and socialization effects of self-esteem and narcissism.** Next, we tested for selection and socialization, using the structural model shown in Figure 2. Following the



definitions provided in the Introduction, selection effects were operationalized as the prospective effect of a personality construct (i.e., self-esteem and narcissism at Wave 1) on stressful life events experienced in the subsequent period (i.e., interval between Wave 1 and Wave 4), and socialization effects were operationalized as the prospective effect of stressful life events (i.e., interval between Wave 1 and Wave 4) on change in a personality construct (i.e., self-esteem and narcissism at Wave 4, controlling for the previous levels of the constructs at Wave 1). Thus, we aggregated the life event data across the study period (by summing the events assessed at Waves 2 to 4, thereby capturing events experienced in the interval between Wave 1 and Wave 4). Aggregating the life events across the three assessments is useful because it substantially increases the reliability of the life event measure. Later, we will test whether the effects are altered when they are assessed across intervals of different length. The Wave 4 residuals of self-esteem and narcissism were correlated (not shown in Figure 2). Given that previous research has shown that selection and socialization effects are of particular importance in the relation between stressful life events and depression (Hammen, 2005; Kessler, 1997), we examined whether selection and socialization effects of self-esteem and narcissism hold when depression is controlled for. We therefore tested two versions of the model in which the effects were uncontrolled versus controlled for depression. To control for depression, the model additionally included latent depression factors at Waves 1 and 4. Selection and socialization effects of depression were modeled as for self-esteem and narcissism, and the relations of depression with self-esteem and narcissism were modeled as for the relations between self-esteem and narcissism (i.e., correlations of the Wave 1 factors, directed paths between the Wave 1 and Wave 4 factors, and correlations of the Wave 4 residual variances).

The fit of the selection-socialization models was good (Table 2). The results showed that the selection effect of self-esteem was significant when depression was not controlled for (indicating that low self-esteem at Wave 1 predicted the occurrence of stressful life events during the study period); however, when depression was controlled for, the effect was no longer significant. Moreover, regardless of whether depression was controlled for or not, stressful life events had a significant socialization effect on self-esteem, suggesting that the occurrence of stressful life events during the study period led to a decrease in self-esteem. In addition, although the selection and socialization effect of narcissism were in the expected direction, these effects were nonsignificant (regardless of whether depression was controlled for or not). Thus, controlling for depression did not significantly alter the findings, with the important exception that the selection effect of self-esteem became nonsignificant when depression was controlled for.

Then, we sought to examine whether stressful life events lead to more stable changes versus temporary changes in self-esteem and narcissism. We therefore tested three additional models, in which socialization effects of life events experienced between Waves 1 and 2 were tested across three different intervals (specifically, effects on self-esteem and narcissism measured at Waves 2, 3, and 4). Whereas the socialization effect on self-esteem was significant in all three models, the effect on narcissism was nonsignificant in each model (Table 3). Moreover, the pattern of findings held when depression was controlled for. Although the socialization effect on self-esteem became slightly larger when tested across longer periods, the difference between the coefficients was nonsignificant.<sup>2</sup> In any case, the coefficients did not become smaller with increasing intervals, suggesting that the socialization effect of stressful life

events on self-esteem is not limited to very short periods (such as the 6-month period between two waves) but holds at least across the period examined in the present study (i.e., 18 months).

**Trait and state components in self-esteem and narcissism.** Because the analyses suggested that stressful life events influence self-esteem but do not influence narcissism, we tested for a possible explanation of the absence of socialization effects on narcissism. Specifically, the high stability of narcissism (as indicated by the large autoregressive effect from Wave 1 to Wave 4; Figure 2) raises the possibility that the trait character of narcissism is simply so strong that life events cannot lead to changes in this construct. We therefore estimated the trait and state components in self-esteem and narcissism based on trait-state models (using the trait-state-occasion model described by Cole, Martin, & Steiger, 2005). Figure 3 provides an illustration of the model, shown for the example of self-esteem (the model for narcissism was specified accordingly). Self-esteem and narcissism were measured as latent variables in the same way as shown in Figure 1, including metric invariance constraints. In the model, the variance of the construct is partitioned into a time-invariant (i.e., trait) component and a time-varying (i.e., state) component. Thus, the trait factor influences the construct at each measurement occasion in the same way, whereas the state factors explain variance that is specific for the measurement occasions. The model accounts for the fact that state factors at adjacent measurement occasions are related by including a first-order autoregressive structure between the state factors. Moreover, the model accounts for the assumption of stationarity, which implies that the variance explained by each source is the same at each measurement occasion (Kenny & Zautra, 2001).<sup>3</sup>

The fit of the trait-state models was good (Table 2). Table 4 shows the estimates of trait and state variances. For self-esteem, both trait and state variances were significant. The trait factor explained 77% of the total variance of the latent self-esteem factors, which is consistent

with findings from previous studies suggesting that self-esteem has a strong trait component (Donnellan, Kenny, Trzesniewski, Lucas, & Conger, 2012; Kuster & Orth, 2013). However, for narcissism only the trait variance was significant, while the state variance was nonsignificant. Moreover, the trait factor explained 86% of the total variance of the latent narcissism factors. Thus, the variance of the latent narcissism factors consisted almost exclusively of trait variance, suggesting that it is unlikely that narcissism can be influenced—at least across a medium-term period as examined in the present study—by other factors such as life events.

## Study 2

### Method

The data used in Study 2 come from the study *My Partner and I (MPI)*, a German-language study of couples living in Switzerland (Orth, 2013). The study included two assessments at 6-month intervals; moreover, the study included an intermediate phase with diary assessments, which were not used in the present research. Data were collected using Web-based questionnaires. Participants were recruited by contacting members of the same university-based online panel that was used in Study 1; however, panel members who were invited for Study 1 were not invited for the MPI. Participants received information on the purpose and procedure of the study and were informed that their data would be treated as strictly confidential. After providing informed consent, participants received individual links to the assessments. After completion of the study, participants were provided with individualized feedback on selected study variables (i.e., how their scale scores compared with population norms) and received 80 Swiss francs in exchange for participation in the study.

**Participants.** The sample included 371 individuals (50% female).<sup>4</sup> At Wave 1, mean age of participants was 29.0 years ( $SD = 8.8$ , range 18 to 61). Of the participants, 10% had completed

the obligatory 9 school years or less, 54% had completed secondary education (approximately 12 years), 15% had a bachelor's degree, 19% had a master's degree, and 2% had a doctoral degree. Of the participants, 92% provided data at two waves and 8% at one wave. To investigate the potential impact of attrition, we compared individuals who dropped out of the study with individuals who completed the last wave of data collection, using the study variables at Wave 1. Participants who dropped out reported higher depression than those who did not drop out ( $M_s = 0.80$  vs.  $0.58$ ;  $d = 0.50$ ). Although the difference in depression was of medium size, differences in age, gender, education, self-esteem, and narcissism were nonsignificant. Thus, nonrepresentativeness due to attrition was not a concern in the present study.

### **Measures.**

***Self-esteem.*** Self-esteem was assessed with the 10-item RSE, using a 5-point scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). Coefficient alpha was .91 at both Wave 1 and Wave 2.

***Narcissism.*** Narcissism was assessed with the NPI, using the 16-item short form suggested by Ames et al. (2006). For each item, the narcissistic statement was coded as 1 and the nonnarcissistic statement was coded as 0. Coefficient omega was .79 at Wave 1 and .77 at Wave 2.

***Stressful life events.*** Stressful life events were measured with the same checklist as in Study 1, except that the event "rejection by a person you loved" was not assessed (thus the checklist included 15 items). At Wave 2, participants were asked which of the events they had experienced during the past six months (corresponding to the period between assessments).

***Depression.*** Depression was assessed with the 20-item CES-D. For each item, participants reported how frequently they experienced the symptom during the past week using a

4-point scale (0 = *rarely or none of the time, less than one day*; 1 = *some or a little of the time, one to two days*; 2 = *occasionally or a moderate amount of time, three to four days*; 3 = *most or all of the time, five to seven days*). Coefficient alpha was .89 at both Wave 1 and Wave 2.

**Statistical Analyses.** Analyses were conducted using the same procedures as in Study 1.

## Results and Discussion

Table 5 shows means and standard deviations of the measures (for intercorrelations among the measures, see Supplemental Table S2).

**Measurement invariance of self-esteem and narcissism.** As in Study 1, we first tested for metric measurement invariance of self-esteem and narcissism. The measurement models were similar to the models used in Study 1, except that now the models included only two waves of data. Again, we used item parcels as indicators of the latent factors and created the parcels using the balancing technique. The fit of the measurement models was good (Table 6). For both self-esteem and narcissism, constraining the loadings to be equal across waves did not significantly worsen model fit, as indicated by  $\chi^2$ -difference tests for both self-esteem ( $\Delta\chi^2 = 5.9$ ,  $\Delta df = 2$ , *ns*) and narcissism ( $\Delta\chi^2 = 1.1$ ,  $\Delta df = 2$ , *ns*), suggesting that metric measurement invariance held. Consequently, we used these constraints in the remainder of the analyses.

**Selection and socialization effects of self-esteem and narcissism.** Next, we tested for selection and socialization, using the same models as in Study 1—i.e., models in which the effects were uncontrolled versus controlled for depression (Figure 4). The fit of the models was good (Table 6). The results were similar to Study 1. The selection effect of self-esteem was significant when depression was not controlled for, and nonsignificant when depression was controlled for. Moreover, regardless of whether depression was controlled for or not, stressful life events had a significant socialization effect on self-esteem. In contrast to Study 1, the

uncontrolled selection effect of narcissism was significant, but it became nonsignificant when depression was controlled for. Finally, stressful life events had a significant socialization effect on narcissism, which however was nonsignificant after depression was controlled for.

### **Meta-Analytic Aggregation of the Findings**

Next, we meta-analytically aggregated the findings across the two studies. We computed weighted mean effect sizes for selection and socialization effects of self-esteem and narcissism, both with and without controlling for depression. For the meta-analytic computations, we used SPSS 20 and the SPSS macros written by Daniel B. Wilson (Lipsey & Wilson, 2001, Appendix D). All computations with effect sizes were made using Fisher's  $Z_r$  transformations. For computing the weighted mean effect sizes, we used random-effects models and study weights with  $w = n - 3$  (Lipsey & Wilson, 2001; Raudenbush, 2009).

Table 7 shows the results. First, whereas the uncontrolled selection effect of self-esteem was significant and in the hypothesized direction, the effect was nonsignificant when depression was controlled for.<sup>5</sup> Second, the selection effect of narcissism was significant, regardless of whether depression was controlled for or not (controlled effect = .09). Thus, although in both studies the controlled selection effect of narcissism was nonsignificant, aggregating the evidence across studies suggested that the effect was significant. Third, the socialization effect of stressful life events on self-esteem was significant, regardless of whether depression was controlled for or not (controlled effect = -.14). Fourth, the socialization effect on narcissism was nonsignificant and virtually zero.

### **General Discussion**

In this research, we examined whether self-esteem and narcissism predict the occurrence of stressful life events (i.e., selection) and whether stressful life events predict change in self-

esteem and narcissism (i.e., socialization), using data from two longitudinal studies. The effects of self-esteem and narcissism were mutually controlled for each other and, moreover, controlled for effects of depression. After conducting the study-level analyses, we meta-analytically aggregated the findings. Self-esteem had a selection effect, suggesting that low self-esteem led to the occurrence of stressful life events; however, this effect became nonsignificant when depression was controlled for. Regardless of whether depression was controlled for or not, narcissism had a selection effect, suggesting that high narcissism led to the occurrence of stressful life events. Moreover, stressful life events had a socialization effect on self-esteem, but not on narcissism, suggesting that the occurrence of stressful life events decreased self-esteem. Analyses of trait-state models indicated that narcissism consisted almost exclusively of perfectly stable trait variance, providing a possible explanation for the absence of socialization effects on narcissism. In the following, we discuss these findings in more detail.

### **Implications of the Findings**

The present results suggested that people's level of narcissism, but not self-esteem, contributes to the occurrence of stressful life events. Whereas the self-esteem selection effect was significant (and relatively strong) when depression was not included in the model, this effect became nonsignificant after the effect of depression was controlled for. Controlling for depression is important because previous research has shown that depression has a strong selection effect on stressful life events (e.g., Davila et al., 1997; Hammen, 1991; Hammen, 2005). However, although the selection effect of self-esteem was nonsignificant after controlling for depression, it might still be relevant. As mentioned in the Introduction, a growing body of research suggests that low self-esteem leads to depression (Orth et al., 2008; Orth, Robins, Trzesniewski, et al., 2009; Sowislo & Orth, 2013; Steiger et al., 2014; for a review, see Orth &



Robins, 2013). Thus, the selection effect of low self-esteem on stressful life events might be mediated by depression, so that the direct self-esteem effect becomes nonsignificant when depression is controlled for. In other words, low self-esteem might contribute to the occurrence of stressful life events through an indirect effect via depression.

The significant selection effect of narcissism suggests that narcissism is maladaptive for the individual, because narcissistic individuals generate adverse events in their lives. Even if the effect was small, the selection effect of narcissism might accumulate across longer periods, leading to relatively stressful life circumstances. As reviewed in the Introduction, theoretical perspectives suggest that the socially toxic attributes of narcissism contribute to the occurrence of interpersonal conflicts and experiences of rejection by romantic partners and friends (Morf & Rhodewalt, 2001; Tracy et al., 2009). Moreover, narcissistic individuals are prone to impulsive and risk-taking behavior, which might contribute to the occurrence of accidents and serious illnesses (Foster et al., 2009; Vazire & Funder, 2006). In future research, it would be highly interesting to examine in more detail the social, emotional, and cognitive mechanisms through which narcissism selects for stressful life events. Thus, the findings of the present research suggest—although some life events may happen at random—that the occurrence of stressful life events is not independent of the individual's personality in terms of narcissism, which is consistent with findings on selection effects of other personality characteristics such as the Big Five (Headey & Wearing, 1989; Lüdtke et al., 2011; Magnus et al., 1993).

With regard to socialization effects, the findings indicated that stressful life events predict a decrease in self-esteem with small to medium effect size. Moreover, the socialization effect on self-esteem did not become smaller with increasing time interval between the events and the assessment of self-esteem, suggesting that the effect is not temporary but might hold across

longer periods. Although at first sight this finding is not surprising, we believe that it is important. First, as reviewed in the Introduction, previous research on socialization effects yielded inconsistent findings (Joiner et al., 1999; Murrell et al., 1991; Orth, Robins, & Meier, 2009; Pettit & Joiner, 2001). In the present research, the finding replicated consistently across the two studies, strengthening the evidence in support of socialization effects of stressful life events on self-esteem. Second, a general issue in research on self-esteem development is that, although relatively strong evidence is available on the consequences of self-esteem (Kuster et al., 2013; Orth et al., 2012; Trzesniewski et al., 2006), the evidence on the causes of self-esteem is still limited (for a review, see Orth & Robins, 2014). Thus, the present research contributes to the understanding of those factors that may shape self-esteem development.

In contrast to self-esteem, no socialization effects were observed for narcissism; across both studies, the aggregated effect was virtually zero. Thus, the results suggest that it is not likely that stressful experiences such as failure, rejection, separation, and diseases influence people's level of narcissism. The multi-wave design of Study 1 (including four waves of measurement) allowed testing for a possible explanation of the absence of socialization effects on narcissism, by estimating the amount of trait and state variance in the constructs. The analyses showed that narcissism consisted almost exclusively of trait variance and that, in contrast to self-esteem, the variance of the state component of narcissism was nonsignificant. The strong trait character of narcissism is an interesting finding in its own right. It shows that narcissism is a very stable personality construct that virtually does not change, at least across medium-term periods as examined in Study 1. Given that surprisingly little information on the stability of narcissism is available (del Rosario & White, 2005; Schütz et al., 2004), in future research it would be highly interesting to further study the degree, and conditions, of stability and change in narcissism

(Thomaes, Brummelman, Reijntjes, & Bushman, 2013). Cross-sectional data suggest that people's level of narcissism might change over time, at least when change is tracked across decades rather than years (Foster, Campbell, & Twenge, 2003; Roberts, Edmonds, & Grijalva, 2010).

The pattern of the present findings does not support the corresponive principle sometimes suggested by research on personality development (Lüdtke et al., 2011; Roberts, Caspi, & Moffitt, 2003; Sutin, Costa, Wethington, & Eaton, 2010). The corresponive principle states that life experiences typically deepen those personality characteristics that lead people to the experiences in the first place, in the form of a positive feedback loop of selection and socialization effects (Roberts et al., 2008). For example, in the study by Lüdtke et al. (2011), extraversion prospectively predicted the occurrence of positive events, and positive events in turn predicted an increase in extraversion; moreover, neuroticism prospectively predicted the occurrence of negative events, which in turn predicted an increase in neuroticism. However, in the present research, the corresponive principle did not hold for either self-esteem or narcissism. A qualification is, however, that selection and socialization effects of self-esteem did show a corresponive pattern if depression was not controlled for. Thus, assuming that self-esteem has an indirect selection effect on stressful life events (i.e., mediated by depression), the corresponive principle holds for self-esteem.

### **Limitations and Future Directions**

A limitation of the present research is that the data of the two studies were collected across an 18-month (Study 1) and 6-month (Study 2) interval only. In future research on selection and socialization effects of self-esteem and narcissism, longer study periods should be used because some events occur only rarely, which decreases the precision of the estimates of

selection and socialization effects. Consequently, these events can be studied more validly across longer periods. Also, longer study periods would allow testing whether the socialization effects of stressful life events on self-esteem are persistent across long periods (such as many years or even decades) or whether people typically regain their previous level of self-esteem after some years, even if a stressful event first led to significant loss in self-esteem. Moreover, although the sample sizes of the present research were not small, in future research larger samples would be desirable because this also would facilitate the sampling of rare events. In addition, larger samples would allow the use of propensity score matching (Rosenbaum & Rubin, 1983; Thoemmes & Kim, 2011), a method that can strengthen the validity of causal conclusions about the effects of life events in observational studies (see also Luhmann, Orth, Specht, Kandler, & Lucas, 2014).

Given that the present research focused on the developmental period of young and middle adulthood, future research should extend the analysis to other developmental periods, such as adolescence and old age. Although it is possible that the general pattern of selection and socialization effects holds across the life span, research shows that developmental periods differ substantially with regard to the typical level of self-esteem and narcissism. For example, adolescence is characterized by low self-esteem and high narcissism, in midlife self-esteem is generally high and narcissism low, whereas in old age both self-esteem and narcissism are relatively low (Foster et al., 2003; Orth et al., 2012; Orth et al., 2010; Roberts et al., 2010). Thus, given these developmental trends in self-esteem and narcissism, it is possible that the effects observed in the present research do not replicate in each developmental period.

Strengths of the present research include the availability of well-validated measures of self-esteem and narcissism, the presence of measurement invariance in these measures, and the

modeling of self-esteem and narcissism as latent constructs, which increased the validity of the findings by controlling for the confounding influence of measurement error (Cole & Preacher, 2014). Also, an important strength is that the present research examined both self-esteem and narcissism. Given that the constructs of self-esteem and narcissism partially overlap (in fact, in the present research the two constructs were positively correlated with a medium to strong effect size), theory suggests that more valid insights into the effects of these two personality characteristics can be gained when the constructs are mutually controlled for each other (Donnellan et al., 2005; Paulhus et al., 2004; Tracy et al., 2009). Moreover, in the analyses we controlled for the effects of depression (a construct that has strong links to stressful life events), providing insights into the unique selection and socialization effects of self-esteem and narcissism. Finally, a strength of the present research is that the findings were replicated across two studies and meta-analytically aggregated, increasing the precision of the estimates and the generalizability of the findings.

In conclusion, the present research improves our understanding of self-esteem and narcissism by providing evidence on selection and socialization effects with regard to stressful life events. The findings suggest that a high level of narcissism is maladaptive for the individual because narcissism increases the chances that the person will experience stressful life events. Also, the findings suggest that people's self-esteem suffers when stressful life events occur and that this decrease is not temporary but relatively stable, holding across at least medium-term periods such as the 18-month period examined in Study 1. Moreover, although both self-esteem and narcissism are trait-like personality characteristics, the analyses indicated that the trait component of narcissism is particularly strong. The findings of the present research have significant implications from a practical perspective because they suggest that in the context of

stressful life events intervention efforts might be needed to help individuals protect, or recover, their sense of self-worth. Moreover, although it might be difficult to alter people's level of narcissism, reducing narcissism might have a beneficial effect on the individual's well-being through reducing the likelihood of stressful life experiences. Finally, under the assumption that depression mediates the selection effect of low self-esteem, increasing people's self-esteem would also reduce the likelihood of future stressful life events.

## References

- Aalsma, M. C., Lapsley, D. K., & Flannery, D. J. (2006). Personal fables, narcissism, and adolescent adjustment. *Psychology in the Schools, 43*, 481-491.
- Ackerman, R. A., Witt, E. A., Donnellan, M. B., Trzesniewski, K. H., Robins, R. W., & Kashy, D. A. (2011). What does the Narcissistic Personality Inventory really measure? *Assessment, 18*, 67-87. doi: 10.1177/1073191110382845
- Ames, D. R., Rose, P., & Anderson, C. P. (2006). The NPI-16 as a short measure of narcissism. *Journal of Research in Personality, 40*, 440-450.
- Bollen, K., & Lennox, R. (1991). Conventional wisdom on measurement: A structural equation perspective. *Psychological Bulletin, 110*, 305-314.
- Bosson, J. K., Lakey, C. E., Campbell, W. K., Zeigler-Hill, V., Jordan, C. H., & Kernis, M. H. (2008). Untangling the links between narcissism and self-esteem: A theoretical and empirical review. *Social and Personality Psychology Compass, 2*, 1415-1439.
- Brown, R. P., & Zeigler-Hill, V. (2004). Narcissism and the non-equivalence of self-esteem measures: A matter of dominance? *Journal of Research in Personality, 38*, 585-592.
- Caspi, A., Roberts, B. W., & Shiner, R. L. (2005). Personality development: Stability and change. *Annual Review of Psychology, 56*, 453-484.
- Chung, J. M., Robins, R. W., Trzesniewski, K. H., Nofhle, E. E., Roberts, B. W., & Widaman, K. F. (2014). Continuity and change in self-esteem during emerging adulthood. *Journal of Personality and Social Psychology, 106*, 469-483. doi: 10.1037/a0035135
- Clogg, C. C., Petkova, E., & Haritou, A. (1995). Statistical methods for comparing regression coefficients between models. *American Journal of Sociology, 100*, 1261-1293.

- Cohen, J., Cohen, P., West, S. G., & Aiken, L. S. (2003). *Applied multiple regression/correlation analysis for the behavioral sciences*. Mahwah, NJ: Erlbaum.
- Cole, D. A., Martin, N. C., & Steiger, J. H. (2005). Empirical and conceptual problems with longitudinal trait-state models: Introducing a trait-state-occasion model. *Psychological Methods, 10*, 3-20.
- Cole, D. A., & Maxwell, S. E. (2003). Testing mediational models with longitudinal data: Questions and tips in the use of structural equation modeling. *Journal of Abnormal Psychology, 112*, 558-577. doi: 10.1037/0021-843X.112.4.558
- Cole, D. A., & Preacher, K. J. (2014). Manifest variable path analysis: Potentially serious and misleading consequences due to uncorrected measurement error. *Psychological Methods, 19*, 300-315. doi: 10.1037/a0033805
- Corry, N., Merritt, R. D., Mrug, S., & Pamp, B. (2008). The factor structure of the Narcissistic Personality Inventory. *Journal of Personality Assessment, 90*, 593-600.
- Davila, J., Bradbury, T. N., Cohan, C. L., & Tochluk, S. (1997). Marital functioning and depressive symptoms: Evidence for a stress generation model. *Journal of Personality and Social Psychology, 73*, 849-861.
- del Rosario, P. M., & White, R. M. (2005). The Narcissistic Personality Inventory: Test-retest stability and internal consistency. *Personality and Individual Differences, 39*, 1075-1081.
- Donnellan, M. B., Kenny, D. A., Trzesniewski, K. H., Lucas, R. E., & Conger, R. D. (2012). Using trait-state models to evaluate the longitudinal consistency of global self-esteem from adolescence to adulthood. *Journal of Research in Personality, 46*, 634-645.
- Donnellan, M. B., Trzesniewski, K. H., & Robins, R. W. (2011). Self-esteem: Enduring issues and controversies. In T. Chamorro-Premuzic, S. von Stumm, & A. Furnham (Eds.), *The*



*Wiley-Blackwell handbook of individual differences* (pp. 718-746). Chichester, UK:

Wiley-Blackwell.

Donnellan, M. B., Trzesniewski, K. H., Robins, R. W., Moffitt, T. E., & Caspi, A. (2005). Low self-esteem is related to aggression, antisocial behavior, and delinquency. *Psychological Science, 16*, 328-335.

Eaton, W. W., Smith, C., Ybarra, M., Muntaner, C., & Tien, A. (2004). Center for Epidemiologic Studies Depression Scale: Review and revision (CESD and CESD-R). In M. E. Maruish (Ed.), *The use of psychological testing for treatment planning and outcomes assessment: Volume 3 (Instruments for adults)* (pp. 363-377). Mahwah, NJ: Erlbaum.

Edelstein, R. S., Newton, N. J., & Stewart, A. J. (2012). Narcissism in midlife: Longitudinal changes in and correlates of women's narcissistic personality traits. *Journal of Personality, 80*, 1179-1204.

Egan, S. K., & Perry, D. G. (1998). Does low self-regard invite victimization? *Developmental Psychology, 34*, 299-309.

Emmons, R. A. (1987). Narcissism: Theory and measurement. *Journal of Personality and Social Psychology, 52*, 11-17.

Erol, R. Y., & Orth, U. (2011). Self-esteem development from age 14 to 30 years: A longitudinal study. *Journal of Personality and Social Psychology, 101*, 607-619. doi: 10.1037/a0024299

Erol, R. Y., & Orth, U. (2013). Actor and partner effects of self-esteem on relationship satisfaction and the mediating role of secure attachment between the partners. *Journal of Research in Personality, 47*, 26-35.

Finkel, S. E. (1995). *Causal analysis with panel data*. Thousand Oaks, CA: Sage.

- Foster, J. D., & Campbell, W. K. (2007). Are there such things as "Narcissists" in social psychology? A taxometric analysis of the Narcissistic Personality Inventory. *Personality and Individual Differences, 43*, 1321-1332.
- Foster, J. D., Campbell, W. K., & Twenge, J. M. (2003). Individual differences in narcissism: Inflated self-views across the lifespan and around the world. *Journal of Research in Personality, 37*, 469-486.
- Foster, J. D., Shenese, J. W., & Goff, J. S. (2009). Why do narcissists take more risks? Testing the roles of perceived risks and benefits of risky behaviors. *Personality and Individual Differences, 47*, 885-889.
- Hammen, C. (1991). Generation of stress in the course of unipolar depression. *Journal of Abnormal Psychology, 100*, 555-561.
- Hammen, C. (2005). Stress and depression. *Annual Review of Clinical Psychology, 1*, 293-319.
- Hautzinger, M., & Bailer, M. (1993). *Allgemeine Depressions-Skala (ADS): Manual [Center for Epidemiologic Studies Depression Scale (CES-D): Manual]*. Weinheim: Beltz.
- Headey, B., & Wearing, A. (1989). Personality, life events, and subjective well-being: Toward a dynamic equilibrium model. *Journal of Personality and Social Psychology, 57*, 731-739.
- Hu, L., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling, 6*, 1-55. doi: 10.1080/10705519909540118
- Joiner, T. E., Katz, J., & Lew, A. (1999). Harbingers of depressotypic reassurance seeking: Negative life events, increased anxiety, and decreased self-esteem. *Personality and Social Psychology Bulletin, 25*, 632-639.

- Kandler, C., Bleidorn, W., Riemann, R., Angleitner, A., & Spinath, F. M. (2012). Life events as environmental states and genetic traits and the role of personality: A longitudinal twin study. *Behavior Genetics, 42*, 57-72.
- Kenny, D. A., & Zautra, A. (2001). Trait-state models for longitudinal data. In L. M. Collins & A. G. Sayer (Eds.), *New methods for the analysis of change* (pp. 243-263). Washington, DC: American Psychological Association.
- Kessler, R. C. (1997). The effects of stressful life events on depression. *Annual Review of Psychology, 48*, 191-214.
- Kuster, F., & Orth, U. (2013). The long-term stability of self-esteem: Its time-dependent decay and nonzero asymptote. *Personality and Social Psychology Bulletin, 39*, 677-690. doi: 10.1177/0146167213480189
- Kuster, F., Orth, U., & Meier, L. L. (2013). High self-esteem prospectively predicts better work conditions and outcomes. *Social Psychological and Personality Science, 4*, 668-675. doi: 10.1177/1948550613479806
- Leary, M. R., & Baumeister, R. F. (2000). The nature and function of self-esteem: Sociometer theory. In M. P. Zanna (Ed.), *Advances in experimental social psychology* (Vol. 32, pp. 1-62). San Diego, CA: Academic Press.
- Lipsey, M. W., & Wilson, D. B. (2001). *Practical meta-analysis*. Thousand Oaks, CA: Sage.
- Little, T. D., Cunningham, W. A., Shahar, G., & Widaman, K. F. (2002). To parcel or not to parcel: Exploring the question, weighing the merits. *Structural Equation Modeling, 9*, 151-173. doi: 10.1207/S15328007SEM0902\_1

- Little, T. D., Preacher, K. J., Selig, J. P., & Card, N. A. (2007). New developments in latent variable panel analyses of longitudinal data. *International Journal of Behavioral Development, 31*, 357-365.
- Little, T. D., Rhemtulla, M., Gibson, K., & Schoemann, A. M. (2013). Why the items versus parcels controversy needn't be one. *Psychological Methods, 18*, 285-300. doi: 10.1037/a0033266
- Lucas, R. E. (2007). Long-term disability is associated with lasting changes in subjective well-being: Evidence from two nationally representative longitudinal studies. *Journal of Personality and Social Psychology, 92*, 717-730.
- Lüdtke, O., Roberts, B. W., Trautwein, U., & Nagy, G. (2011). A random walk down university avenue: Life paths, life events, and personality trait change at the transition to university life. *Journal of Personality and Social Psychology, 101*, 620-637.
- Luhmann, M., Hofmann, W., Eid, M., & Lucas, R. E. (2012). Subjective well-being and adaptation to life events: A meta-analysis. *Journal of Personality and Social Psychology, 102*, 592-615.
- Luhmann, M., Orth, U., Specht, J., Kandler, C., & Lucas, R. E. (2014). Studying changes in life circumstances and personality: It's about time. *European Journal of Personality, 28*, 256-266.
- MacCallum, R. C., & Austin, J. T. (2000). Applications of structural equation modeling in psychological research. *Annual Review of Psychology, 51*, 201-226. doi: 10.1146/annurev.psych.51.1.201

- Magnus, K., Diener, E., Fujita, F., & Pavot, W. (1993). Extraversion and neuroticism as predictors of objective life events: A longitudinal analysis. *Journal of Personality and Social Psychology*, 65, 1046-1053.
- McDonald, R. P. (1999). *Test theory: A unified treatment*. Mahwah, NJ: Erlbaum.
- Morf, C. C., & Rhodewalt, F. (2001). Unraveling the paradoxes of narcissism: A dynamic self-regulatory processing model. *Psychological Inquiry*, 12, 177-196.
- Murray, S. L., Holmes, J. G., & Griffin, D. W. (1996a). The benefits of positive illusions: Idealization and the construction of satisfaction in close relationships. *Journal of Personality and Social Psychology*, 70, 79-98.
- Murray, S. L., Holmes, J. G., & Griffin, D. W. (1996b). The self-fulfilling nature of positive illusions in romantic relationships: Love is not blind, but prescient. *Journal of Personality and Social Psychology*, 71, 1155-1180.
- Murray, S. L., Holmes, J. G., & Griffin, D. W. (2000). Self-esteem and the quest for felt security: How perceived regard regulates attachment processes. *Journal of Personality and Social Psychology*, 78, 478-498.
- Murray, S. L., Rose, P., Bellavia, G. M., Holmes, J. G., & Kusche, A. G. (2002). When rejection stings: How self-esteem constrains relationship-enhancing processes. *Journal of Personality and Social Psychology*, 83, 556-573.
- Murrell, S. A., Meeks, S., & Walker, J. (1991). Protective functions of health and self-esteem against depression in older adults facing illness or bereavement. *Psychology and Aging*, 6, 352-360.
- Muthén, L. K., & Muthén, B. O. (2012). *Mplus user's guide: Seventh edition*. Los Angeles, CA: Muthén and Muthén.

Neyer, F. J., & Asendorpf, J. B. (2001). Personality-relationship transaction in young adulthood.

*Journal of Personality and Social Psychology*, 81, 1190-1204.

Orth, U. (2013). How large are actor and partner effects of personality on relationship

satisfaction? The importance of controlling for shared method variance. *Personality and*

*Social Psychology Bulletin*, 39, 1359-1372.

Orth, U., Maes, J., & Schmitt, M. (2015). Self-esteem development across the life span: A

longitudinal study with a large sample from Germany. *Developmental Psychology*, 51,

248-259.

Orth, U., & Robins, R. W. (2013). Understanding the link between low self-esteem and

depression. *Current Directions in Psychological Science*, 22, 455-460.

Orth, U., & Robins, R. W. (2014). The development of self-esteem. *Current Directions in*

*Psychological Science*, 23, 381-387. doi: 10.1177/0963721414547414

Orth, U., Robins, R. W., & Meier, L. L. (2009). Disentangling the effects of low self-esteem and

stressful events on depression: Findings from three longitudinal studies. *Journal of*

*Personality and Social Psychology*, 97, 307-321.

Orth, U., Robins, R. W., Meier, L. L., & Conger, R. D. (in press). Refining the vulnerability

model of low self-esteem and depression: Disentangling the effects of genuine self-

esteem and narcissism. *Journal of Personality and Social Psychology*.

Orth, U., Robins, R. W., & Roberts, B. W. (2008). Low self-esteem prospectively predicts

depression in adolescence and young adulthood. *Journal of Personality and Social*

*Psychology*, 95, 695-708.

- Orth, U., Robins, R. W., Trzesniewski, K. H., Maes, J., & Schmitt, M. (2009). Low self-esteem is a risk factor for depressive symptoms from young adulthood to old age. *Journal of Abnormal Psychology, 118*, 472-478.
- Orth, U., Robins, R. W., & Widaman, K. F. (2012). Life-span development of self-esteem and its effects on important life outcomes. *Journal of Personality and Social Psychology, 102*, 1271-1288. doi: 10.1037/a0025558
- Orth, U., Trzesniewski, K. H., & Robins, R. W. (2010). Self-esteem development from young adulthood to old age: A cohort-sequential longitudinal study. *Journal of Personality and Social Psychology, 98*, 645-658. doi: 10.1037/a0018769
- Paulhus, D. L., Robins, R. W., Trzesniewski, K. H., & Tracy, J. L. (2004). Two replicable suppressor situations in personality research. *Multivariate Behavioral Research, 39*, 303-328.
- Pettit, J. W., & Joiner, T. E. (2001). Negative life events predict negative feedback seeking as a function of impact on self-esteem. *Cognitive Therapy and Research, 25*, 733-741.
- Radloff, L. S. (1977). The CES-D Scale: A self-report depression scale for research in the general population. *Applied Psychological Measurement, 1*, 385-401.
- Raskin, R. N., & Hall, C. S. (1979). A narcissistic personality inventory. *Psychological Reports, 45*, 590.
- Raskin, R. N., & Terry, H. (1988). A principal-components analysis of the Narcissistic Personality Inventory and further evidence of its construct validity. *Journal of Personality and Social Psychology, 54*, 890-902.

- Raudenbush, S. W. (2009). Analyzing effect sizes: Random-effects models. In H. Cooper, L. V. Hedges, & J. C. Valentine (Eds.), *The handbook of research synthesis and meta-analysis* (pp. 295-315). New York, NY: Russell Sage Foundation.
- Raykov, T., Dimitrov, D. M., & Asparouhov, T. (2010). Evaluation of scale reliability with binary measures using latent variable modeling. *Structural Equation Modeling*, 17, 265-279.
- Roberts, B. W., Caspi, A., & Moffitt, T. E. (2003). Work experiences and personality development in young adulthood. *Journal of Personality and Social Psychology*, 84, 582-593.
- Roberts, B. W., & DeVecchio, W. F. (2000). The rank-order consistency of personality traits from childhood to old age: A quantitative review of longitudinal studies. *Psychological Bulletin*, 126, 3-25. doi: 10.1037/0033-2909.126.1.3
- Roberts, B. W., Edmonds, G., & Grijalva, E. (2010). It is developmental me, not Generation Me: Developmental changes are more important than generational changes in narcissism--Commentary on Trzesniewski & Donnellan (2010). *Perspectives on Psychological Science*, 5, 97-102.
- Roberts, B. W., Wood, D., & Caspi, A. (2008). The development of personality traits in adulthood. In O. P. John, R. W. Robins, & L. A. Pervin (Eds.), *Handbook of personality: Theory and research* (pp. 375-398). New York, NY: Guilford.
- Robins, R. W., Hendin, H. M., & Trzesniewski, K. H. (2001). Measuring global self-esteem: Construct validation of a single-item measure and the Rosenberg Self-Esteem Scale. *Personality and Social Psychology Bulletin*, 27, 151-161. doi: 10.1177/0146167201272002



- Rosenbaum, P. R., & Rubin, D. B. (1983). The central role of the propensity score in observational studies for causal effects. *Biometrika*, 70, 41-55.
- Rosenberg, M. (1965). *Society and the adolescent self-image*. Princeton, NJ: Princeton University Press.
- Schafer, J. L., & Graham, J. W. (2002). Missing data: Our view of the state of the art. *Psychological Methods*, 7, 147-177. doi: 10.1037/1082-989X.7.2.147
- Schmitt, N., & Kuljanin, G. (2008). Measurement invariance: Review of practice and implications. *Human Resource Management Review*, 18, 210-222.
- Schütz, A., Marcus, B., & Selin, I. (2004). Die Messung von Narzissmus als Persönlichkeitskonstrukt: Psychometrische Eigenschaften einer Lang- und einer Kurzform des Deutschen NPI (Narcissistic Personality Inventory) [Measuring narcissism as a personality construct: Psychometric properties of a long and a short version of the German Narcissistic Personality Inventory]. *Diagnostica*, 50, 202-218.
- Sedikides, C., Rudich, E. A., Gregg, A. P., Kumashiro, M., & Rusbult, C. (2004). Are normal narcissists psychologically healthy? Self-esteem matters. *Journal of Personality and Social Psychology*, 87, 400-416.
- Sowislo, J. F., & Orth, U. (2013). Does low self-esteem predict depression and anxiety? A meta-analysis of longitudinal studies. *Psychological Bulletin*, 139, 213-240. doi: 10.1037/a0028931
- Specht, J., Bleidorn, W., Denissen, J. J. A., Hennecke, M., Hutteman, R., Kandler, C., . . . Zimmermann, J. (2014). What drives adult personality development? A comparison of theoretical perspectives and empirical evidence. *European Journal of Personality*, 28, 216-230. doi: 10.1002/per.1966

- Specht, J., Egloff, B., & Schmukle, S. C. (2011). Stability and change of personality across the life course: The impact of age and major life events on mean-level and rank-order stability of the Big Five. *Journal of Personality and Social Psychology, 101*, 862-882. doi: 10.1037/a0024950
- Steiger, A. E., Allemand, M., Robins, R. W., & Fend, H. A. (2014). Low and decreasing self-esteem during adolescence predict adult depression two decades later. *Journal of Personality and Social Psychology, 106*, 325-338. doi: 10.1037/a0035133
- Streiner, D. L. (2003). Being inconsistent about consistency: When coefficient alpha does and doesn't matter. *Journal of Personality Assessment, 80*, 217-222.
- Sutin, A. R., Costa, P. T., Wethington, E., & Eaton, W. (2010). Turning points and lessons learned: Stressful life events and personality trait development across middle adulthood. *Psychology and Aging, 25*, 524-533.
- Thoemmes, F. J., & Kim, E. S. (2011). A systematic review of propensity score methods in the social sciences. *Multivariate Behavioral Research, 46*, 90-118.
- Thomaes, S., Brummelman, E., Reijntjes, A., & Bushman, B. J. (2013). When Narcissus was a boy: Origins, nature, and consequences of childhood narcissism. *Child Development Perspectives, 7*, 22-26.
- Tracy, J. L., Cheng, J. T., Robins, R. W., & Trzesniewski, K. H. (2009). Authentic and hubristic pride: The affective core of self-esteem and narcissism. *Self and Identity, 8*, 196-213.
- Trzesniewski, K. H., Donnellan, M. B., Moffitt, T. E., Robins, R. W., Poulton, R., & Caspi, A. (2006). Low self-esteem during adolescence predicts poor health, criminal behavior, and limited economic prospects during adulthood. *Developmental Psychology, 42*, 381-390. doi: 10.1037/0012-1649.42.2.381

- Trzesniewski, K. H., Donnellan, M. B., & Robins, R. W. (2003). Stability of self-esteem across the life span. *Journal of Personality and Social Psychology*, 84, 205-220. doi: 10.1037/0022-3514.84.1.205
- Trzesniewski, K. H., Donnellan, M. B., & Robins, R. W. (2013). Development of self-esteem. In V. Zeigler-Hill (Ed.), *Self-esteem* (pp. 60-79). London, UK: Psychology Press.
- Vaidya, J. G., Gray, E. K., Haig, J., & Watson, D. (2002). On the temporal stability of personality: Evidence for differential stability and the role of life experiences. *Journal of Personality and Social Psychology*, 83, 1469-1484.
- Vazire, S., & Funder, D. C. (2006). Impulsivity and the self-defeating behavior of narcissists. *Personality and Social Psychology Review*, 10, 154-165.
- von Collani, G., & Herzberg, P. Y. (2003). Eine revidierte Fassung der deutschsprachigen Skala zum Selbstwertgefühl nach Rosenberg [A revised German version of the Rosenberg Self-Esteem Scale]. *Zeitschrift für Differentielle und Diagnostische Psychologie*, 24, 3-7.
- Wagner, J., Lüdtke, O., Jonkmann, K., & Trautwein, U. (2013). Cherish yourself: Longitudinal patterns and conditions of self-esteem change in the transition to young adulthood. *Journal of Personality and Social Psychology*, 104, 148-163. doi: 10.1037/a0029680
- Watson, P. J., & Biderman, M. D. (1993). Narcissistic Personality Inventory factors, splitting, and self-consciousness. *Journal of Personality Assessment*, 61, 41-57.
- Widaman, K. F. (2006). Missing data: What to do with or without them. *Monographs of the Society for Research in Child Development*, 71, 42-64. doi: 10.1111/j.1540-5834.2006.00404.x

- Widaman, K. F., Ferrer, E., & Conger, R. D. (2010). Factorial invariance within longitudinal structural equation models: Measuring the same construct across time. *Child Development Perspectives, 4*, 10-18. doi: 10.1111/j.1750-8606.2009.00110.x
- Widaman, K. F., Little, T. D., Preacher, K. J., & Sawalani, G. M. (2011). On creating and using short forms of scales in secondary research. In K. H. Trzesniewski, M. B. Donnellan, & R. E. Lucas (Eds.), *Secondary data analysis: An introduction for psychologists* (pp. 39-61). Washington, DC: American Psychological Association.

## Footnotes

<sup>1</sup> The full sample of the YP includes 344 individuals. However, 16 participants did not provide data on the study variables of the present research.

<sup>2</sup> No formal significance test for the difference between the socialization effects across different intervals is available because the regression coefficients (a) are based on a partially, but not fully, overlapping set of variables and (b) are estimated in separate models. In this situation, none of the tests discussed in, for example, Cohen, Cohen, West, and Aiken (2003) and Clogg, Petkova, and Haritou (1995) is applicable. We therefore used confidence intervals as an approximate means of comparing the coefficients (although formally not a test of the difference between the coefficients). The 95% confidence intervals of the controlled socialization effects were  $[-.25, -.06]$  for self-esteem measured at Wave 2,  $[-.28, -.07]$  at Wave 3, and  $[-.33, -.12]$  at Wave 4, clearly suggesting that the coefficients did not differ significantly.

<sup>3</sup> Following Kenny and Zautra (2001), this requirement can be met by using constraints on the variance of the Wave 1 state factor and on the residual variances of the Wave 2 to Wave 4 state factors (the Wave 2 to Wave 4 factors are endogenous and, consequently, the model does not include variances for these variables). In the present analyses, the appropriate constraints were as follows:  $v = u_2 / (1 - a^2)$  and  $u_2 = u_3 = u_4$ ; where  $v$  is the variance of the Wave 1 state factor,  $u_2$  to  $u_4$  are the residual variances of the Wave 2 to Wave 4 state factors, and  $a$  is the autoregressive effect between adjacent state factors.

<sup>4</sup> The full sample of the MPI includes 372 individuals. However, one participant did not provide data on the study variables of the present research.

<sup>5</sup> Although the controlled selection effect of self-esteem was larger than the controlled selection effect of narcissism, the self-esteem effect was nonsignificant whereas the narcissism

effect was significant. The reason is that for self-esteem the selection effect differed more strongly across studies, which resulted in a larger confidence interval. Thus, the evidence did not support the conclusion that the selection effect of self-esteem is significantly different from zero, when depression was controlled for.

Table 1

*Means and Standard Deviations of Measures (Study 1)*

Variable	Wave 1		Wave 2		Wave 3		Wave 4	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Self-esteem	3.85	0.83	3.83	0.79	3.91	0.80	3.88	0.80
Narcissism	0.36	0.19	0.35	0.19	0.35	0.19	0.36	0.19
Stressful life events <sup>a</sup>	—	—	1.29	1.66	1.14	1.51	1.30	1.66
Depression	0.77	0.51	0.79	0.54	0.71	0.48	0.74	0.45

*Note.* Response scales ranged from 1 to 5 for self-esteem, from 0 to 1 for narcissism, and from 0 to 3 for depression. The range of possible values for stressful life events was 0 to 16.

<sup>a</sup> Stressful life events were assessed for the 6-month interval that preceded the assessment. For example, the score at Wave 2 indicates the number of stressful life events between Wave 1 and Wave 2.

Table 2

*Fit of the Models Tested (Study 1)*

Model	$\chi^2$	df	CFI	TLI	RMSEA [90% CI]
Measurement models (Figure 1)					
Self-esteem					
Configural invariance	31.5	30	1.00	1.00	.008 [.000, .043]
Metric invariance	34.9	36	1.00	1.00	.000 [.000, .038]
Narcissism					
Configural invariance	37.0	30	1.00	.99	.027 [.000, .052]
Metric invariance	45.3	36	.99	.99	.028 [.000, .051]
Selection-socialization models (Figure 2)					
Not controlled for depression	51.1	54	1.00	1.00	.000 [.000, .032]
Controlled for depression	151.9	129	.99	.99	.023 [.000, .037]
Trait-state models (Figure 3)					
Self-esteem	42.7	43	1.00	1.00	.000 [.000, .037]
Narcissism	55.0	43	.99	.99	.029 [.000, .050]

*Note.* All  $\chi^2$ -values were nonsignificant. CFI = comparative fit index; TLI = Tucker–Lewis index; RMSEA = root-mean-square error of approximation; CI = confidence interval.



Table 3

*Socialization Effects of Stressful Life Events that Occurred Between Waves 1 and 2 Across Intervals of Different Length (Study 1)*

Wave at which outcome was measured	Outcome	
	Self-esteem	Narcissism
Wave 2	-.16* (-.16*)	.03 (.02)
Wave 3	-.15* (-.18*)	-.12 (-.11)
Wave 4	-.21* (-.22*)	.01 (.00)

*Note.* The table shows standardized regression coefficients of stressful life events measured at Wave 2 (i.e., experienced between Waves 1 and 2) across intervals of different length (i.e., on self-esteem and narcissism measured at Waves 2, 3, and 4). Coefficients in parentheses are controlled for depression. The coefficients were estimated with models that were structurally identical to the model shown in Figure 2. Thus, all coefficients are controlled for the prior levels of the outcomes (i.e., self-esteem and narcissism at Wave 1).

\*  $p < .05$ .

Table 4

*Variance in Self-Esteem and Narcissism Explained by Trait and State Factors (Study 1)*

Construct	Variance			Proportion of variance explained by trait factor
	Trait factor	State factor	Sum <sup>a</sup>	
Self-esteem	0.557*	0.171*	0.728*	77%
Narcissism	0.032*	0.005	0.037*	86%

<sup>a</sup> The sum of trait and state variance equals the estimated variance of the wave-specific construct factors.

\*  $p < .05$ .

Table 5

*Means and Standard Deviations of Measures (Study 2)*

Variable	Wave 1		Wave 2	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Self-esteem	4.07	0.75	4.17	0.75
Narcissism	0.34	0.18	0.34	0.18
Stressful life events <sup>a</sup>	—	—	1.02	1.58
Depression	0.60	0.43	0.56	0.43

*Note.* Response scales ranged from 1 to 5 for self-esteem, from 0 to 1 for narcissism, and from 0 to 3 for depression. The range of possible values for stressful life events was 0 to 15.

<sup>a</sup> Stressful life events were assessed for the 6-month interval that preceded the assessment. Thus, the score at Wave 2 indicates the number of stressful life events between Wave 1 and Wave 2.

Table 6

*Fit of the Models Tested (Study 2)*

Model	$\chi^2$	df	CFI	TLI	RMSEA [90% CI]
Measurement models (Figure 1)					
Self-esteem					
Configural invariance	8.1	5	1.00	1.00	.041 [.000, .090]
Metric invariance	14.0	7	1.00	.99	.052 [.000, .092]
Narcissism					
Configural invariance	9.5	5	1.00	.98	.049 [.000, .097]
Metric invariance	10.6	7	1.00	.99	.037 [.000, .080]
Selection-socialization models (Figure 4)					
Not controlled for depression	92.6*	54	.99	.98	.044 [.028, .059]
Controlled for depression	172.0*	129	.99	.99	.030 [.016, .041]

*Note.* CFI = comparative fit index; TLI = Tucker–Lewis index; RMSEA = root-mean-square error of approximation; CI = confidence interval.

\*  $p < .05$ .

Table 7

*Meta-Analytic Aggregation of the Findings from Study 1 and Study 2*

Effect	Weighted mean		
	effect size <sup>a</sup>	95% CI	Homogeneity ( <i>Q</i> )
Selection effects			
Self-esteem			
Not controlled for depression	-.23*	[-.30, -.16]	0.0
Controlled for depression	.12	[-.04, .27]	4.6*
Narcissism			
Not controlled for depression	.13*	[.05, .20]	0.9
Controlled for depression	.09*	[.01, .16]	0.4
Socialization effects			
Self-esteem			
Not controlled for depression	-.15*	[-.22, -.08]	0.0
Controlled for depression	-.14*	[-.21, -.07]	0.0
Narcissism			
Not controlled for depression	.00	[-.20, .20]	6.9*
Controlled for depression	.01	[-.19, .20]	7.0*

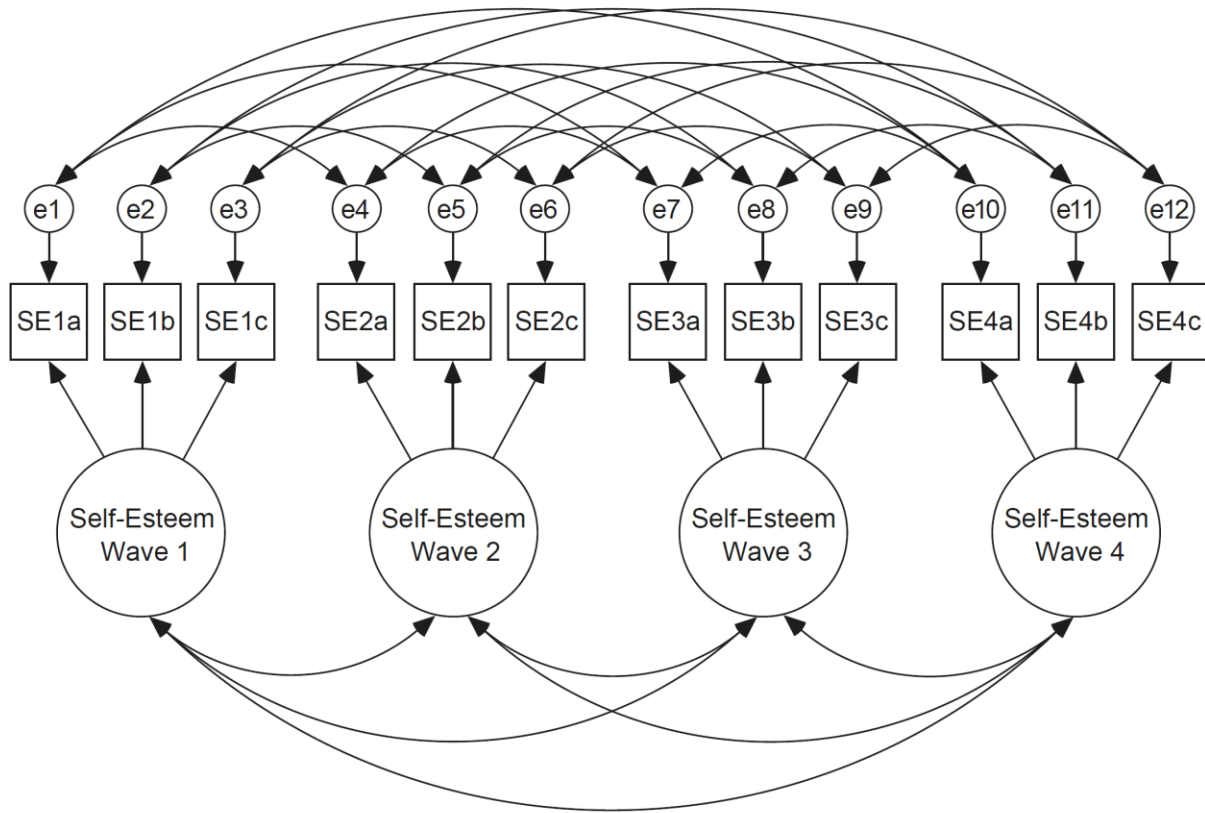
*Note.* Computations were made with a random-effects model. For all meta-analytic

computations, the number of studies was  $k = 2$  and the total number of participants was  $N = 699$ .

CI = confidence interval.

<sup>a</sup> Standardized regression coefficient.

\*  $p < .05$ .



*Figure 1.* Measurement model, shown for the example of self-esteem (the measurement model of narcissism was specified accordingly). At each wave, self-esteem was measured by three item parcels (e.g., SE1a to SE1c at Wave 1). Error variances of parcels (denoted as *e1* to *e12*) were correlated across waves to control for bias due to parcel-specific variance (Cole & Maxwell, 2003).

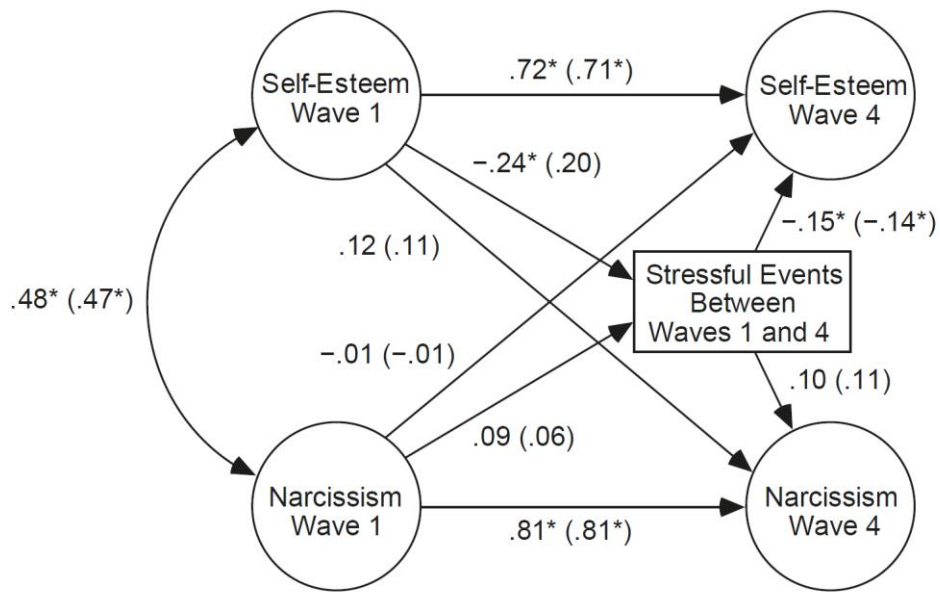
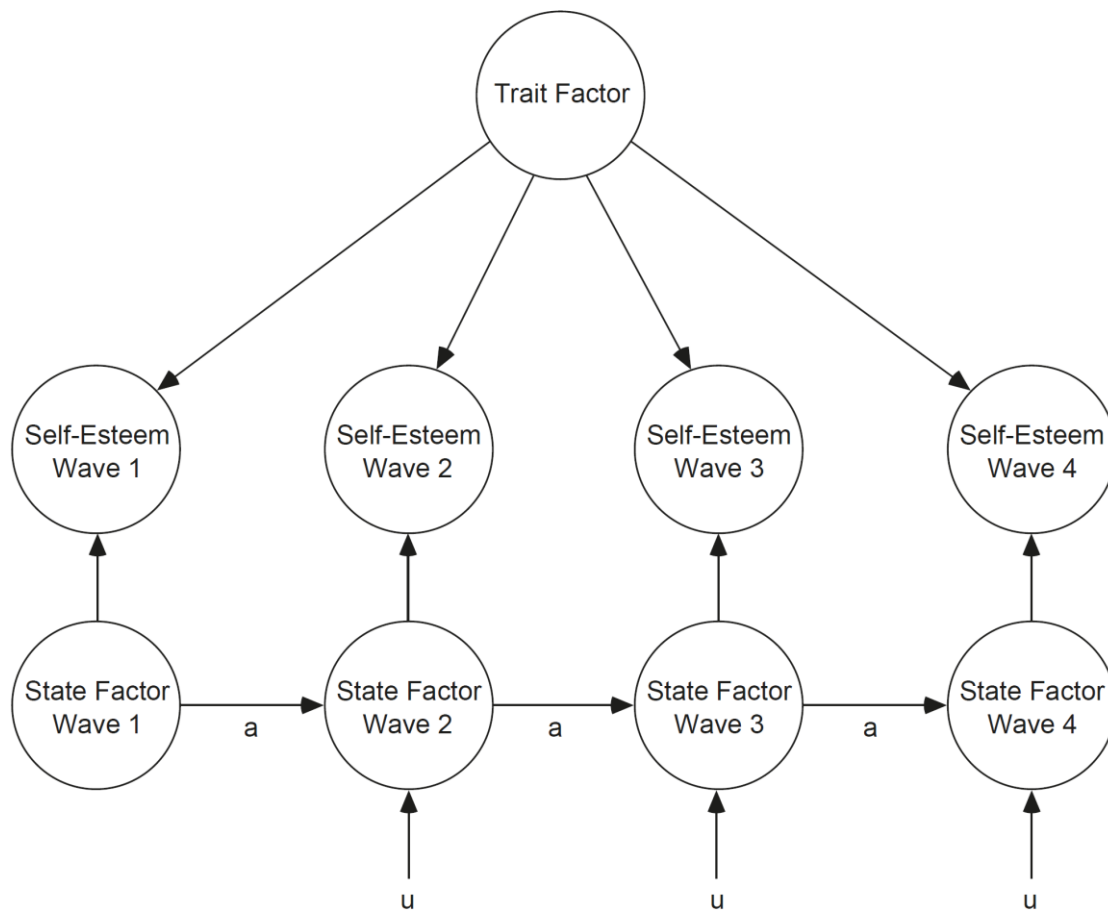


Figure 2. Selection-socialization model of self-esteem, narcissism, and stressful life events

(Study 1). The figure shows standardized regression coefficients. Coefficients in parentheses are controlled for depression. For self-esteem and narcissism, the figure shows only latent constructs and omits observed variables and the intercorrelation of residual variances at Wave 4.

\*  $p < .05$ .



*Figure 3.* Trait-state model, shown for the example of self-esteem (the trait-state model for narcissism was specified accordingly). Each of the latent self-esteem factors at Waves 1 to 4 (which were measured as shown in Figure 1) was explained by the latent trait factor and by a wave-specific latent state factor.  $a$  = autoregressive effect between the latent state factors;  $u$  = residual variance of the latent state factors at Waves 2 to 4.



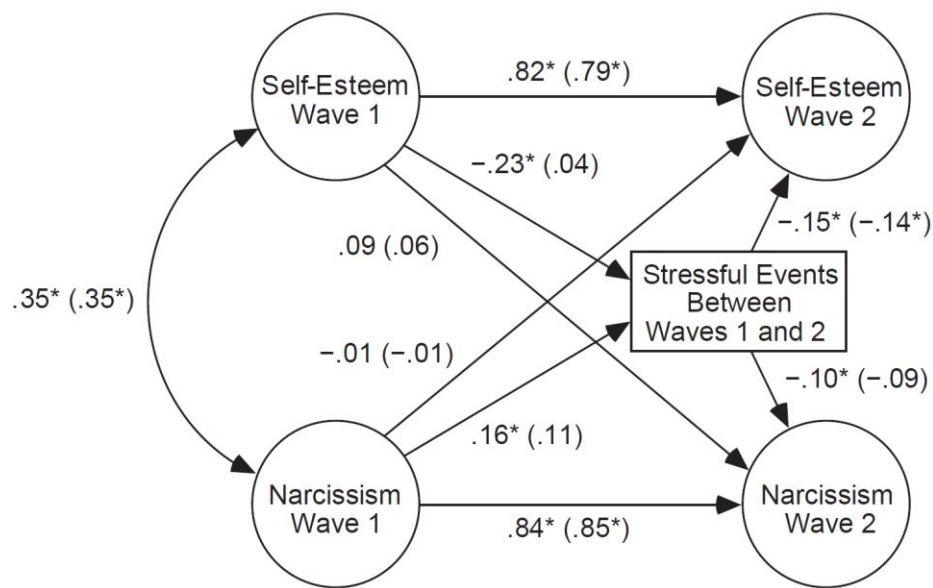


Figure 4. Selection-socialization model of self-esteem, narcissism, and stressful life events

(Study 2). The figure shows standardized regression coefficients. Coefficients in parentheses are controlled for depression. For self-esteem and narcissism, the figure shows only latent constructs and omits observed variables and the intercorrelation of residual variances at Wave 2.

\*  $p < .05$ .